COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

THE APPLICATION OF KENTUCKY UTILITIES COMPANY TO ASSESS A SURCHARGE UNDER KRS 278.183 TO RECOVER COSTS OF COMPLIANCE WITH ENVIRONMENTAL REQUIREMENTS FOR COAL COMBUSTION WASTES AND BY-PRODUCTS	))))))	CASE NO. 93-465

O R D E R

IT IS ORDERED that Kentucky Utilities Company ("KU") shall file the original and 12 copies of the following information with the Commission no later than March 23, 1994, with a copy to all parties of record. Each copy of the data requested should be placed in a bound volume with each item tabbed. When a number of sheets are required for an item, each sheet should be appropriately indexed, for example, Item 1(a), Sheet 2 of 6. Include with each response the name of the witness who will be responsible for responding to questions relating to the information provided. Careful attention should be given to copies material to ensure that it is legible. Where information requested herein has been provided along with the original application, in the format requested herein, reference may be made to the specific location of said information in responding to this information request.

1. Provide the following information on the charges associated with a potential delay or cancellation of the Ghent 1 scrubber:

a. Are the costs to delay equivalent to the cost of cancellation?

b. What is the magnitude of the cost of delay and of cancellation (separately if different) for each year in which charges are incurred?

c. What specific items are the source of cancellation charges?

d. What contracts contain these cancellation charges?

2. Describe the status of KU's option to construct the Ghent 2 scrubber.

a. Are contracts in place with an option to pursue this project?

b. When would these options need to be exercised?

3. Provide the precise definition of "commercially viable" that was used for screening as referenced on page 8 of the September 24, 1993 "Clean Air Act Amendments of 1990 Compliance Plan Reassessment Report" ("Reassessment Report") filed in Case No. 93-383.[1]

4. KU indicated that it has not finalized its methodology for incorporating environmental dispatch. Indicate whether KU has taken any steps to approximate environmental dispatch in its modeling and if so, identify these steps.

5. In the Reassessment Report, KU develops the cost per ton of SO_2 removed as a criteria for screening compliance options. The

---

[1] Case No. 93-382, A Review Pursuant to 807 KAR 5:058 of the 1993 Integrated Resource Plan of Kentucky Utilities Company.

cost per ton measure uses 1995 single year estimates rather than levelized fuel costs. Does the 1995 fuel price reflect a contract rate or a forecast market price?

6. Reference page 13 of the Reassessment Report and the description of Case A1. Under what situations would the Ghent 2 scrubber and switching Ghent 3 and 4 to Powder River Basin coal not be possible?

7. Provide the annual capacity factor and heat rate of each of KU's generating units for each year of the study period for Cases N1, A1, G0 and B0 of the November 1, 1993 "Clean Air Act Amendments of 1990 Compliance Plan UPDATED Reassessment Report" ("UPDATED Reassessment Report") filed in this proceeding.

8. Provide the reasoning for KU's base allowance value of $225/ton. Describe how this 1993 value compares to the price of actual transactions and explain why allowance prices should escalate with the Producer Price Index.

9. Explain how the ICF allowance price forecast was adjusted to nominal dollars as shown in Attachment C of the Reassessment Report. Show a calculation to indicate this adjustment for a representative year.

10. Explain how the ICF fuel forecast was adjusted to nominal dollars as shown in Attachment F of the Reassessment Report. Show a calculation to indicate this adjustment for a representative year.

11. Provide KU's forecast of inflation over the study period.

12. Provide the following information on the transportation costs that underlie Attachment F of the Reassessment Report:

a. Indicate the approximate transportation component of each of the fuel prices.

b. What sources of information were reviewed to estimate the transportation cost of Powder River Basin coal? What is the approximate routing of the coal that was used to estimate transportation costs?

c. What is the annual escalation rate assumed for transportation costs for each year of the study?

d. Explain any differences in assumptions between the Reassessment Report and the UPDATED Reassessment Report.

13. In the Reassessment Report at pages 15-16, KU tests up to a 71 percent decline in fuel premiums, a change which would cause a shift in the preferred plan.

a. What range of fuel premiums does KU consider to be reasonable in order to capture the uncertainty in this variable?

b. Does KU's forecast include such a range? If so, what is this range?

14. KU varied fuel premiums in 18 percent increments to test the importance of this variable. Explain whether this adjustment reflects an 18 percent decline in the first-year premium with escalation from a lower starting point or a uniform 18 percent decline in every year.

15. List the analytical tasks that were performed by each of the following models:

a. ENPRO.

b. PROSCREEN.

c. Spreadsheets.

16. In those evaluations where the Ghent 1 scrubber is delayed, provide the assumed cost of the scrubber compared to the cost of constructing the scrubber by 1995.

17. Reference page 22 of the Reassessment Report. How did KU reach the conclusion that a delay of the Ghent 1 scrubber to mid-year 1996 warrants further study if this option was not analyzed in the Reassessment Report? What is the basis for this conclusion?

18. On page 7 of the Reassessment Report, KU notes that measures of shareholder effects are earnings per share and interest coverage. However, in Attachment O, these performance measures are not recorded. How were shareholder effects measured for this analysis? Provide the measures that were used for the Reassessment Report and the UPDATED Reassessment Report.

19. When KU states that a value is in 1995 dollars, does this mean nominal dollars as of 1995? If not, what is the meaning?

20. Case K0 is labeled the "Baseline Limit" case. Explain what is meant by this terminology and why this case was evaluated. How is this case differentiated from the other fuel switch cases?

21. Explain why the capacity factor of the Tyrone and Pineville units is limited for some of the 13 acid rain scenarios evaluated as part of the Reassessment Report.

22. Reference the Reassessment Report. Explain why KU uses a discount rate of 10.29 percent to analyze acid rain compliance

plans but uses a discount rate of 9.73 percent to analyze integrated resource plans. Explain why the discount rate was changed to 9.73 percent for the UPDATED Reassessment Report.

23. Table 3 of Appendix A of the Reassessment Report provides KU's fuel forecast. Provide the sulfur content of these coals. Indicate if these prices are for current contracts, market prices, or a combination. Indicate any changes in this information for the UPDATED Reassessment Report.

24. Provide the Btu content, sulfur content, delivered cost by plant, and minemouth cost for each year of the study period for the following coals:

a. Low-sulfur coal.

b. Medium-sulfur coal.

c. Compliance coal.

d. High-sulfur coal.

e. Coal blends.

f. Any other coal type that was evaluated for acid rain compliance.

25. KU provides two estimates of fuel prices in its 1993 IRP. These are provided as Table 4 on page 7 of Attachment A of Appendix 4 and Table 3 of Appendix A of the Reassessment Report. Why are these forecasts different?

26. Provide the following information regarding each of KU's current coal supply contracts:

a. Date of signature and first delivery.

b. Termination date.

c. Quality parameters including sulfur, Btu, ash, volatility, grind or other requirements.

d. Ability to renegotiate to a different sulfur content.

e. Plants/units served by the contract.

f. Ability to shift coals to an alternative KU plant.

g. Method of delivery.

h. Contract price as of December 31, 1993.

i. Tonnage delivered for calendar year 1993.

27. Provide the wellhead cost of natural gas that underlies KU's forecast as listed on Table 3 of Appendix A of the Reassessment Report.

28. Reference Table 1 of Appendix A of the Reassessment Report. Did the load forecast that was used to complete KU's economic analysis include economy sales? If so, what is the approximate magnitude of economy sales over this period (in mWhs or as a percentage of the total forecast energy)? Provide the same information for the UPDATED Reassessment Report.

29. Reference the first page of Appendix B of the Reassessment Report which lists assumptions used for screening analysis:

a. Provide the FGDCOST runs that provide backup for the wet FGD and dry FGD scrubber costs for small units and large units.

b. There are a number of different wet and dry FGD systems. What type of wet and dry FGD system was used to develop cost estimates?

c. Explain why the cost of blended coal (Blend 50%) is higher for the Green River plant than for other plants?

30. Reference Appendix B of the Reassessment Report where the capital cost of the Ghent 1 scrubber used for screening purposes was $200/kW. The requested capital for the Ghent 1 scrubber in the environmental surcharge proceeding is approximately $215/kW while Table 8 of Appendix A of the Reassessment Report provides another estimate of capital cost.

a. What was the total capital cost used for modeling purposes in the Reassessment Report and in the UPDATED Reassessment Report?

b. How do the values used for the Reassessment Report and the UPDATED Reassessment Report compare to the current projected costs of the project?

31. Provide engineering studies and Coal Quality Impact Model outputs that were used to develop the cost of fuel switching options.

32. The screening analysis completed for the Reassessment Report indicates that switching to Powder River Basin coal at Ghent 3 and 4 represents a savings over the current fuel source.

a. Why would KU delay implementing this option until 2000 or beyond?

b. Provide any analysis of opting Ghent 3 and 4 into Phase I of the Clean Air Act Amendments of 1990 ("CAAA") to take advantage of these savings.

33. Describe KU's methodology for incorporating the economic value of the energy penalty and derate associated with SO_2 removal options. Indicate how these issues were evaluated in both screening analysis and in detailed modeling of the 13 scenarios evaluated in the Reassessment Report and the UPDATED Reassessment Report.

34. Reference the Reassessment Report. List the derate (in MWs or percent of total MW) and energy penalties (in mWhs or % of total energy) that were assumed for each SO_2 removal option that was considered as part of KU's screening analysis. List the values of replacement capacity and energy that were used for evaluation.

35. Did KU analyze a blend of Powder River Basin coal and low-sulfur Appalachian coal? If yes, provide the analysis. If no, explain why not. Explain what investments would be required to burn a coal blend of this type. Explain any technical or plant constraints that would prevent utilizing such a blend.

36. Reference the Reassessment Report. Explain the purpose of the columns on page 1 of Appendix D that are labeled "SO_2 Total (tons)" and "SO_2 (Phase I)" and explain what the values in these columns represent.

37. Reference the Reassessment Report. Provide Appendix E materials for Case N1.

38. Describe how the current project costs (actual to date and expected) for the Ghent 1 scrubber compare to the costs that

were estimated in Case No. 92-005.[2] Explain the basis for any changes in the projected costs.

39. Provide all contracts that pertain to the construction or operation of the Ghent 1 scrubber.

40. Provide the following information for the Ghent 1 FGD system:

a. Does the design include multiple absorber modules or a single module? What are the sizing of the module(s)? What level of redundancy was selected for other key components of the scrubber and related systems?

b. What is the byproduct quality and disposal techniques?

c. What are the design coal quality specifications? Include the maximum and minimum sulfur content.

d. What is the source and transportation method for limestone?

e. What are the ESP outlet particulate loadings assumed in the design?

f. What will be the maximum capacity of Ghent 1 after installation of the scrubber?

g. What is the estimated reliability of the scrubber?

h. What is the flue gas flow rate?

i. What is the calcium to sulfur molar ratio?

---

[2] Case No. 92-005, Application of Kentucky Utilities Company for a Certificate of Convenience and Necessity to Construct a Scrubber on Unit No. 1 of its Ghent Generating Station.

j. Will the scrubber treat 100 percent of the flue gas or bypass the system for a portion?

k. What guarantees or warranties have been given for the scrubber equipment.

l. How similar is this design to other existing wet limestone FGD designs that KU is familiar with?

41. For the Ghent 1 FGD system, break out the capital investment into the following categories. Indicate in which year's dollars the costs are provided. Provide escalation assumptions, if relevant.

Component	Spent	Remaining to Complete
Limestone Handling System		
Limestone Preparation Building		
Flue Gas System		
I.D. Fan Modification		
Absorber Island		
Gypsum Stack Area		
Major Electrical Equipment		
FGD System Water Makeup System		
Site Services/Initial Site work		
Other (define items included)		
Total Construction Cost		
Indirect Expenses		
Contingency		
Total Project Cost		
Other (define items included)		
Total Cost		

42. Complete the following table to reflect the projected operating costs of the Ghent 1 scrubber.

	$ per year	$ per unit
Base First-year Fixed O&M		$/KW-yr
Base First-year Variable O&M		$/mWh
Reagent		$/ton limestone
Waste Disposal		$/ton
Water Usage		$/gallon
Derate		MWs/year
Energy penalty		mWhs/year

43. Provide economic and engineering analyses that support the construction of a wet limestone system for Ghent 1 rather than an alternative scrubber technology such as wet lime FGD or a spray dryer.

44. Describe the process that was used for technical screening of FGD technologies to apply to Ghent 1.

a. What was the methodology for screening and screening criteria?

b. What range of systems was considered?

c. Describe the models, tools, and data sources used for screening.

d. Provide any company reports that summarize this process.

e. What consultants were utilized for this process? Describe their participation.

45. When does KU expect to submit its next general rate case?

46. Provide the overall rate of return ("ROR") as determined by the Commission in KU's last general rate case and the debt and equity components that make up this ROR.

47. KU proposes to use a project specific rate of return on capital costs in the environmental surcharge. Are there any other KU projects that apply a project specific rate of return or do other projects all apply a single rate of return.

48. According to Robinson's testimony, new depreciation schedules will be developed for the Ghent 1 scrubber and gypsum facility. How will KU develop these schedules? What studies are in progress and what is their timetable?

49. KU proposes that inventories of allowances (or the allowance "bank") will earn a rate of return until "used".

a. Indicate what rate of return will be applied to allowance inventories and why this rate is appropriate.

b. How will KU track and determine when allowances are used?

c. What inventory method(s) will be used (i.e., LIFO, FIFO, etc.) to determine when allowances are used?

d. Will all allowances in inventory earn a return regardless of their source? Provide a response for:

(1) Allowances allocated by EPA

(2) Purchased allowances

(3) Allowances that are banked due to over-control of SO_2 emissions.

50. For purposes of calculating the surcharge amounts, what is the value of an allowance? Provide a response for:

a. Initial allocation of allowances from EPA.

b. Purchased allowances.

c. Allowances that are banked due to overcontrol of SO_2 emissions.

51. According to Lucas' testimony at page 8, the decision to build a scrubber at Ghent 1 has allowed KU to defer additional commitments and to bank allowances.

a. How will KU evaluate opportunities for allowance sales?

b. Does KU currently plan to sell allowances?

52. The surcharge formula is based on environmental revenues as a fraction of total revenues. Explain why the surcharge is calculated in this manner rather than as a percent of sales as in the fuel adjustment clause. Would the two methods be likely to differ significantly?

53. Reference the proposed surcharge formula. Explain why the embedded interest rate is included in the pollution control operating expenses.

54. Explain why KU's inclusion of all environmental compliance activities since its last general rate case is in the best interest of ratepayers.

55. Explain how KU will determine the portion of general and administrative costs that are due to environmental compliance.

56. Page 13 of Hewett's testimony includes a discussion of how purchases and sales of allowances would be reflected in calculating the surcharge.

a. Prepare a schedule showing KU's allowance activity through December 31, 1993. The schedule should include the following information:

(1) A classification of all allowances handled by KU as either base, extension, transfer, or bonus.

(2) The number of allowances and the value of the allowances on KU's books at December 31, 1993. Include the basis of valuation for the allowances.

(3) Indicate the vintage year of all allowances identified in subpart (1), when applicable.

(4) For the allowances initially received by KU, identify the generating plants to which the allowances relate.

(5) For allowances purchased, indicate the date of each purchase, the number of allowances included in each purchase, the purchase price of each transaction, and the intended use.

b. Provide all accounting entries made by KU to account for both the initial receipt and later purchase or sale of allowances. Include account numbers, account titles, and transaction descriptions.

c. Wilhite's testimony at page 6 states that revenues from the sale of allowances and by-products will be treated as an offset to costs. Given this statement, explain why KU has not developed a methodology to include sold allowances in the surcharge

calculation. Indicate when KU plans to submit its proposed methodology to the Commission.

57. Exhibit 1 of Lucas' testimony is a schedule of 15 projects which KU proposes to include in its environmental surcharge. Seven of these projects were completed in part or total prior to 1993 while the surcharge statute became effective on January 1, 1993.

a. For each of the 15 projects, provide the rate of return earned on rate base and capital during each quarterly financial period subsequent to the booking of the capital assets. Include all supporting workpapers and calculations used to determine the earned returns.

b. For each of the projects completed prior to the effective date of the surcharge statute, provide the amount of depreciation and other expenses charged to operating expenses. These amounts should be shown for the same quarterly financial periods as were shown in part (a) above.

c. Explain KU's reasons for including projects completed prior to the effective date of the surcharge statute.

d. Explain why KU's proposal to include project costs capitalized prior to October 31, 1993 does not constitute retroactive rate-making.

58. Robinson's testimony includes a discussion of the book and tax depreciation rates to be used on pollution control equipment currently under construction. Based on the most currently available information, provide the book and tax

depreciation rates KU plans to use for pollution control equipment currently under construction.

59. Exhibit 1 of the Robinson's testimony is an analysis of capital expenditures for the 15 projects KU proposes to include in the environmental surcharge. Prepare a revised version of this exhibit, reflecting the following changes:

a. All balances as of December 31, 1993 and January 31, 1994.

b. The third column should show amounts prior to January 1, 1993, rather than June 30, 1982.

60. For each project listed on Robinson Exhibit 1, indicate:

a. The amount of the total project cost funded by pollution control bonds.

b. The source and amount of total project cost not funded by pollution control bonds. Indicate how the sources of funding were identified.

61. In Wilhite's testimony, KU proposes to utilize a surcharge rate base as part of the calculation of the surcharge. One of the components of this surcharge rate base is working capital, which would be computed under the Commission's formula approach applied to annual incremental operation and maintenance ("O&M") expenses of pollution control equipment.

a. Provide any studies or analyses prepared by or for KU which indicate there is a need for the working capital component.

b. Explain why it is appropriate to include a working capital component in the determination of the surcharge.

62. The testimony of several witnesses discusses KU's proposal to establish a "baseline" of pollution control related O&M expenses. The proposed baseline would be set at the calendar 1994 level of pollution control related O&M expense, and would not be included in the surcharge computation until the expense month of January 1995. KU has identified five specific subaccounts to be included in the baseline.

a. Explain why it is appropriate to establish a baseline of O&M expenses, rather than tracking specific O&M expenses which would be eligible for inclusion in the surcharge.

b. Explain why calendar year 1994 was selected for the baseline period.

c. Explain how KU determined that the five identified subaccounts were the appropriate ones to include in the baseline. Include any studies or analyses used in making this determination.

d. Explain why KU should delay the inclusion of the applicable O&M expenses in the calculation of the surcharge.

e. Explain why insurance costs and property taxes were not included in the baseline. Indicate why these costs should not be treated in the same manner as the other O&M expenses.

f. Provide KU's current estimate of the calendar year 1994 baseline for O&M expenses. The information should be shown by subaccounts. Also provide the calendar year 1993 baseline amount, by subaccount.

63. Wilhite's testimony at page 7 indicates that property taxes and insurance related to the pollution control facilities will be included in the surcharge.

a. Explain how KU will determine the pollution control facility portion of its property assessments.

b. Explain how KU will determine the applicable portion of its insurance costs related to pollution control facilities.

c. Indicate whether KU plans to utilize surcharge related subaccounts for the applicable property taxes and insurance costs. Explain the basis for KU's planned approach.

64. KU has proposed that the interest rate on its most recent pollution control bonds be established as an "interim" rate of return for the environmental surcharge, with a "full" rate of return to be used after its next general rate case.

a. Does KU consider a 5.85 percent return on compliance related capital expenditures to be a reasonable return? If not, explain.

b. Provide any studies or analyses performed for or by KU which establish that a rate of 5.85 percent is a reasonable return on compliance related capital expenditures.

c. Explain why it is reasonable for KU to propose a rate of return with an equity component equal to its current cost of tax-exempt, long-term debt.

d. Explain how the use of an "interim" rate of return is authorized by KRS 278.183. Include a discussion of what KU

considers to be a reasonable return on equity considering current economic conditions.

65. Provide all calculations, workpapers, assumptions, variables, and other supporting documentation used to determine the amounts shown on Wilhite Exhibit 5.

66. Provide all calculations, workpapers, assumptions, variables, and other supporting documentation used to determine the estimated impact of the surcharge on residential customers, for both the initial and biennial periods as discussed in Wilhite's testimony at page 13.

67. In developing the environmental surcharge, KU has proposed to use a 1994 baseline for pollution control related O&M expenses and proposed to remove the applicable accumulated depreciation on the surcharge capital projects when determining the surcharge rate base.

a. Explain whether KU agrees that this methodology recognizes that those items are already being recovered in KU's existing rates.

b. Explain how including in the surcharge calculations those capital projects which have been started or completed since KU's last general rate case is consistent with the concepts of baseline expense levels and the recognition of accumulated depreciation.

68. Explain why KU prepared its UPDATED Reassessment Report when its prior report (the Reassessment Report) was prepared less than two months before on September 24, 1993. Indicate how often

KU plans to undertake a reassessment of its Clean Air Act Amendment Compliance Plan.

69. Appendix B of the Reassessment Report included the results of compliance alternatives screened for each KU plant. Explain how the percentage reduction in SO_2 was determined for each alternative. Include all supporting workpapers, calculations, assumptions, and other documentation.

70. The data items used in the Reassessment Report in Appendix A were as of March 1993. The data items used in the UPDATED Reassessment Report in Appendix A were as of October 1993. Compare these appendices, and where an assumption, variable, or table value changed between the two reassessments, explain the reason(s) for each change.

71. Review KU's responses to the following items in the Commission Staff's December 14, 1993 request for information to KU in Case No. 93-382:

a. Item 75.

b. Item 80.

c. Item 89.

d. Items 91 through 109.

e. Items 111 and 112.

Applying the above items to the UPDATED Reassessment Report, does KU adopt and affirm its prior responses? If no, explain why not and provide revised responses.

72. Tables 3 and 6 of Appendix A to the November Reassessment contain various coal, oil, and gas costs.

a. Indicate how these various fuel costs compare with the estimates prepared by the United States Department of Energy ("DOE").

b. Explain whether KU normally compares its fuel cost estimates with information prepared by the DOE. If not, explain why.

73. Provide the economic and technical studies that justify investments 3-15 shown on Lucas' Exhibit 1. If no studies exist, describe the evaluation process that was followed to support these investments. Indicate sources of cost data, alternatives considered, decision criteria and methodology and tools used for the analysis.

74. Describe the key design decisions and design philosophy for the Ghent 1 scrubber.

75. Describe the procurement process for the Ghent 1 scrubber.

a. How did KU ensure a competitive bidding process?

b. What criteria were used to select vendors?

c. Explain whether a turnkey approach was utilized.

d. How complete were the engineering specifications given to vendors?

76. Reference the screening analysis included in the Reassessment Report. It appears that KU uses a nominal fixed charge rate to develop cost per ton SO_2 removed information using fuel costs for the year 1995 only. Does this represent a mixing of

real dollar fuel costs and nominal capital costs? Is this methodology appropriate?

77. Explain why rebuilding precipitators is required to switch the Brown units from their current coal (of about 3.0 lbs. SO_2 per MMBtu) to a 2.0 lbs. SO_2 per MMBtu coal. What studies have been completed to determine that this investment would be required? Why would flue gas conditioning not be adequate?

78. KU has presented a single strategy (E0) that includes reducing emissions from Brown during Phase I of the CAAA. In this strategy, Brown is fuel switched in Phase I but no other compliance actions are undertaken. Were other strategies involving Phase I fuel switching for Brown evaluated? Is so, provide this analysis. If not, why not? Specifically, indicate why early fuel switching at Brown was considered in isolation and not in combination with other SO_2 removal options.

Done at Frankfort, Kentucky, this 4th day of March, 1994.

PUBLIC SERVICE COMMISSION

For the Commission

ATTEST:

Executive Director